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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,133

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Kazushi Wada

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08/31/2009

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EXAMINER

KUO, WENSING W

ART UNIT

PAPER NUMBER

2826

MAIL DATE

DELIVERY MODE

08/31/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/539,133

Applicant(s)

WADA, KAZUSHI

Examiner

W. Wendy Kuo

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-3 and 5-20 are pending. Claims 12-20 stand withdrawn from further consideration as being directed to a non-elected invention.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. **Claims 1-3, 6-7 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Inagaki (US 6,765,246) (hereinafter Inagaki).**

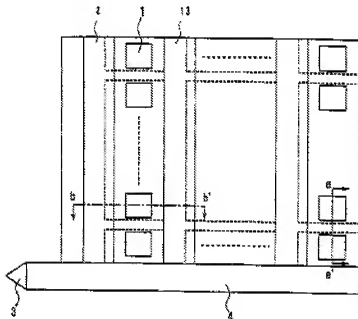


FIG. 1

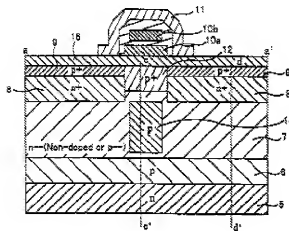


FIG. 2

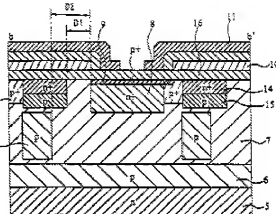


FIG. 3

With respect to claim 1, Inagaki (c.g. Figures 1-3; reproduced above) teaches a solid state image pickup device comprising:

- a semiconductor region 7 on a substrate 5 (Figures 2 and 3), *said semiconductor region having an upper and lower face;*
- a plurality of photo-sensors 1 on the *upper face of the* semiconductor region (column 5, lines 42-44; column 6, lines 2-4 and 20-25);
- a transfer register 2 *which extends in a vertical direction and is located in the* semiconductor region *and* which transfers (column 6, lines 5-9) signal charges accumulated in said photo-sensors (column 5, lines 49-51);
- an impurity region 13 (horizontal gridlines between adjacent photodiodes in vertical direction) *which extends* across substantially the *entirety* of the semiconductor region from one end of the semiconductor region to an opposite end of the semiconductor region in a direction orthogonal to the transfer (vertical) direction of said transfer register (column 6, lines 39-52); *and*

- *a channel stop region 12 which is separate from said impurity region and has a higher impurity concentration than that of the impurity region 13* (column 7, lines 38-41 and 48-51), wherein
- said impurity region 13 is provided between *those of* said photo-sensors 1 *which are* adjacent to each other along the transfer direction of said transfer register in the semiconductor region (column 6, lines 42-46), *and*
- *said channel stop region 12 is located between said photo-sensors 1 adjacent to each other along the transfer direction of said transfer register in the vicinity of the surface of said semiconductor region* (column 6, lines 34-38)

With respect to claim 2, Inagaki (e.g. Figures 2 and 3) teaches that said impurity region 13 is *located closer to the lower face of* the semiconductor region than said transfer register (vertical CCD) (column 6, lines 2-4 and lines 39-42).

With respect to claim 3, Inagaki (e.g. Figure 6) teaches a plurality of said impurity region portions (13a-13c) are in the semiconductor region 7 (column 11, lines 4-8).

With respect to claim 6, Inagaki (e.g. Figures 3 and 6) teaches that in addition to said impurity region portion 13, a first barrier region portion 15 comprised of an impurity region between said photo-sensors (photodiodes) adjacent to each other in the transfer direction of said transfer register and *closer to the upper face of the semiconductor substrate than* said impurity region portion (column 6, lines 46-49).

With respect to claim 7, Inagaki (e.g. Figure 1) teaches a second barrier layer 13 (vertical gridlines between adjacent photodiodes in horizontal direction) (column 6, lines 39-52) comprised of an impurity region portion along said transfer register.

With respect to claim 11, Inagaki teaches that said impurity region portion (13 horizontal gridlines) and the second barrier region portion (13 vertical gridlines) are the same *distance from the lower face of the semiconductor substrate* (column 10, lines 56-64).

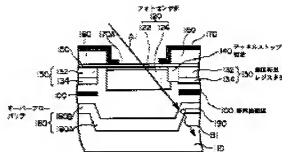
Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. **Claims 5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inagaki in view of Komatsu (JP 02002231924) (abstract) (hereinafter Komatsu).**

With respect to claims 5 and 8, Inagaki remains as applied to claims 1 and 7 above, respectively.

Inagaki (e.g. Figures 2 and 3) further teaches an overflow barrier 6 between the semiconductor layer and the substrate.

Inagaki fails to teach that the overflow barrier is in a projected and recessed shape at an interface thereof in the direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors. Komatsu teaches that the overflow barrier is in a projected (shallow) and recessed (deep) shape at an interface thereof in the direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors (see abstract figure) in order to prevent color mixing and smear by limiting the move of a signal charge between adjacent photosensor sections.



It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the image pickup device of Inagaki with the overflow barrier of Komatsu for the benefit of preventing color mixing and smear by limiting the move of a signal charge between adjacent photosensor sections.

With respect to claims 9 and 10, Inagaki as modified by Komatsu remains as applied to claims 5 and 8 above, respectively. Inagaki further teaches that *the impurity concentration of* said impurity region portion 13 is higher than *that of the impurity concentration of* said overflow barrier 6 (column 7, lines 48-51 and 55-58).

Response to Arguments

6. Applicant's arguments filed 18 May 2009 have been fully considered but they are not persuasive.

Regarding Applicant's response that "nowhere do Inagaki or Komatsu disclose a channel stop region, separate from a impurity region, which has a higher impurity concentration than the impurity region" (remarks at page 7, paragraph 8), it is respectfully noted that Inagaki at column 7, lines 38-41 and lines 48-51 discloses that the impurity concentration of the channel stop region 12 has a higher impurity concentration than the impurity region 13.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Wendy Kuo whose telephone number is (571)270-1859. The examiner can normally be reached Monday through Friday 7:00 AM to 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue A. Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W. Wendy Kuo
Examiner
Art Unit 2826

/Minh-Loan T. Tran/
Primary Examiner
Art Unit 2826